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**Chang et al.**

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(54) **ELECTRICAL CARD CONNECTOR MOUNTED ON PRINTED CIRCUIT BOARD**

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***H01R 24/00*** (2006.01)

(52) **U.S. Cl.** ..... **439/630**; 439/188; 200/51.1

(58) **Field of Classification Search** ..... 439/630, 439/188, 64, 567; 200/51.1
See application file for complete search history.

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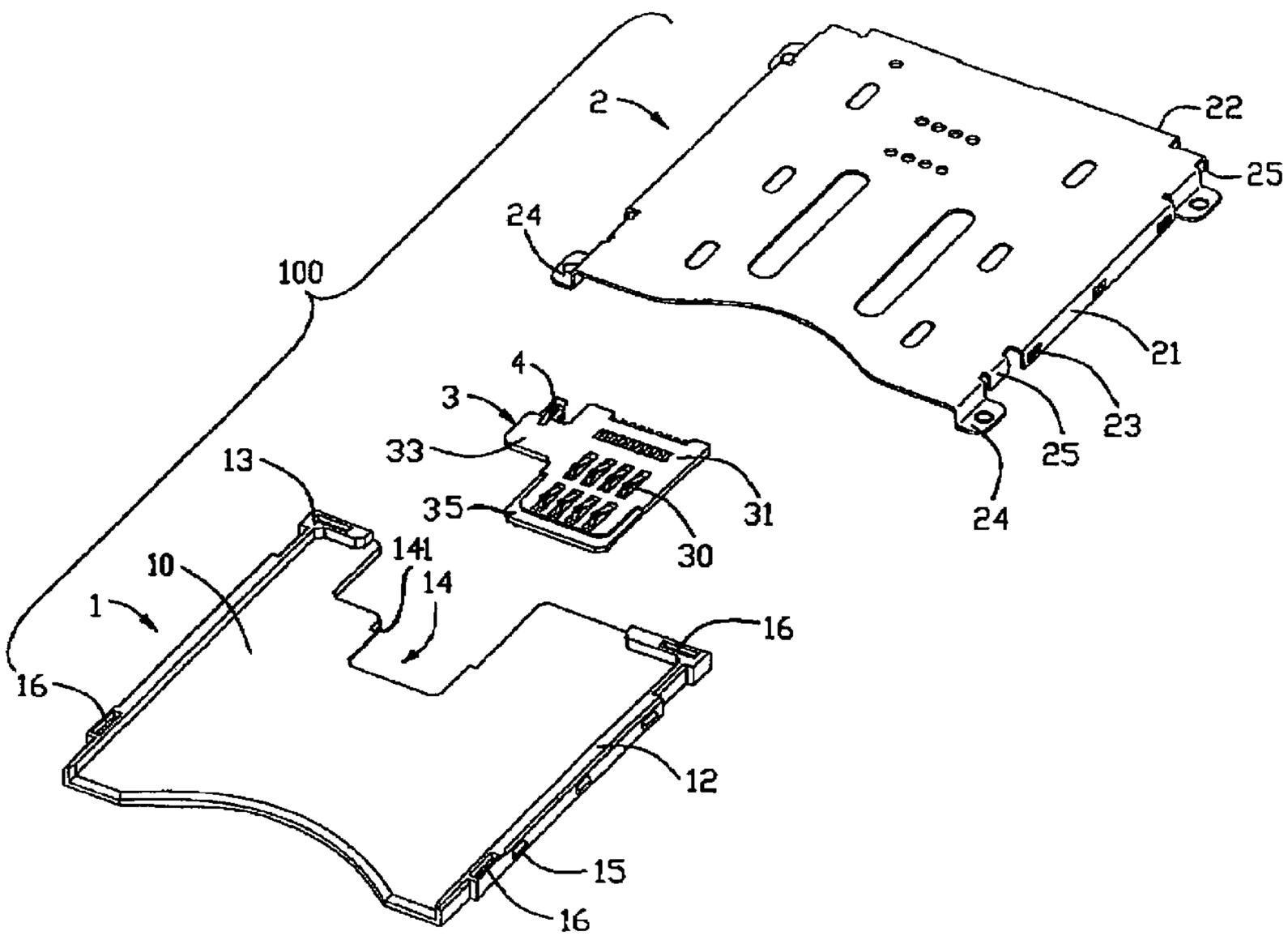
(57) **ABSTRACT**

An electrical card connector (**100**) mounted on a Printed Circuit Board includes an insulating housing (**1**), a shell (**2**) mounted on the insulating housing and a terminal module (**3**). The insulating housing defines an accommodating room (**14**), and the shell defines a receiving slot (**5**) with the insulating housing for a card inserted. The terminal module comprises a plurality of terminals (**30**) and a position section (**32**) retained on the PCB. Wherein the terminal module is soldered on the PCB directly, and receiving in the accommodating room of the insulating housing separately.

**19 Claims, 4 Drawing Sheets**



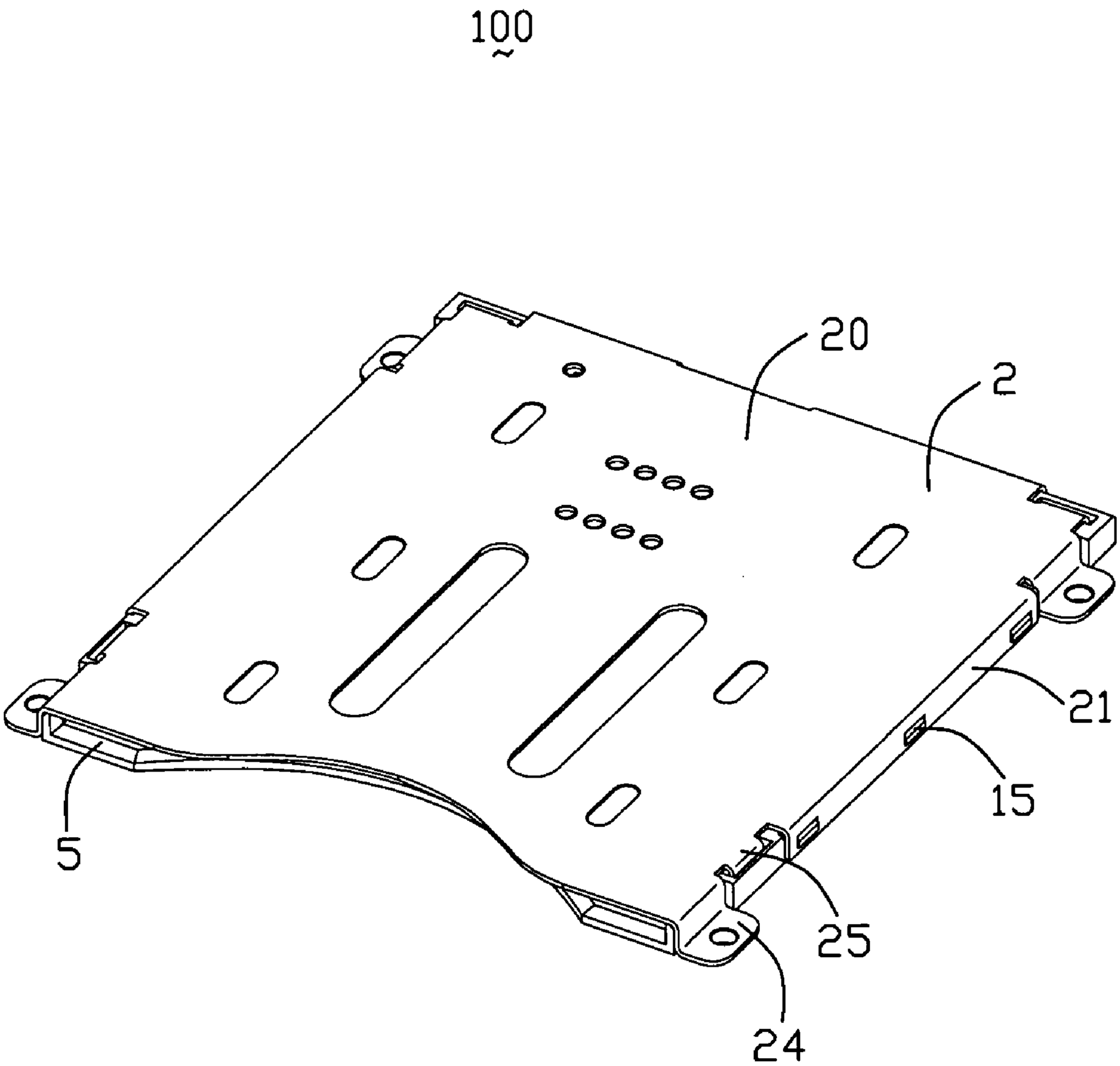



FIG. 1

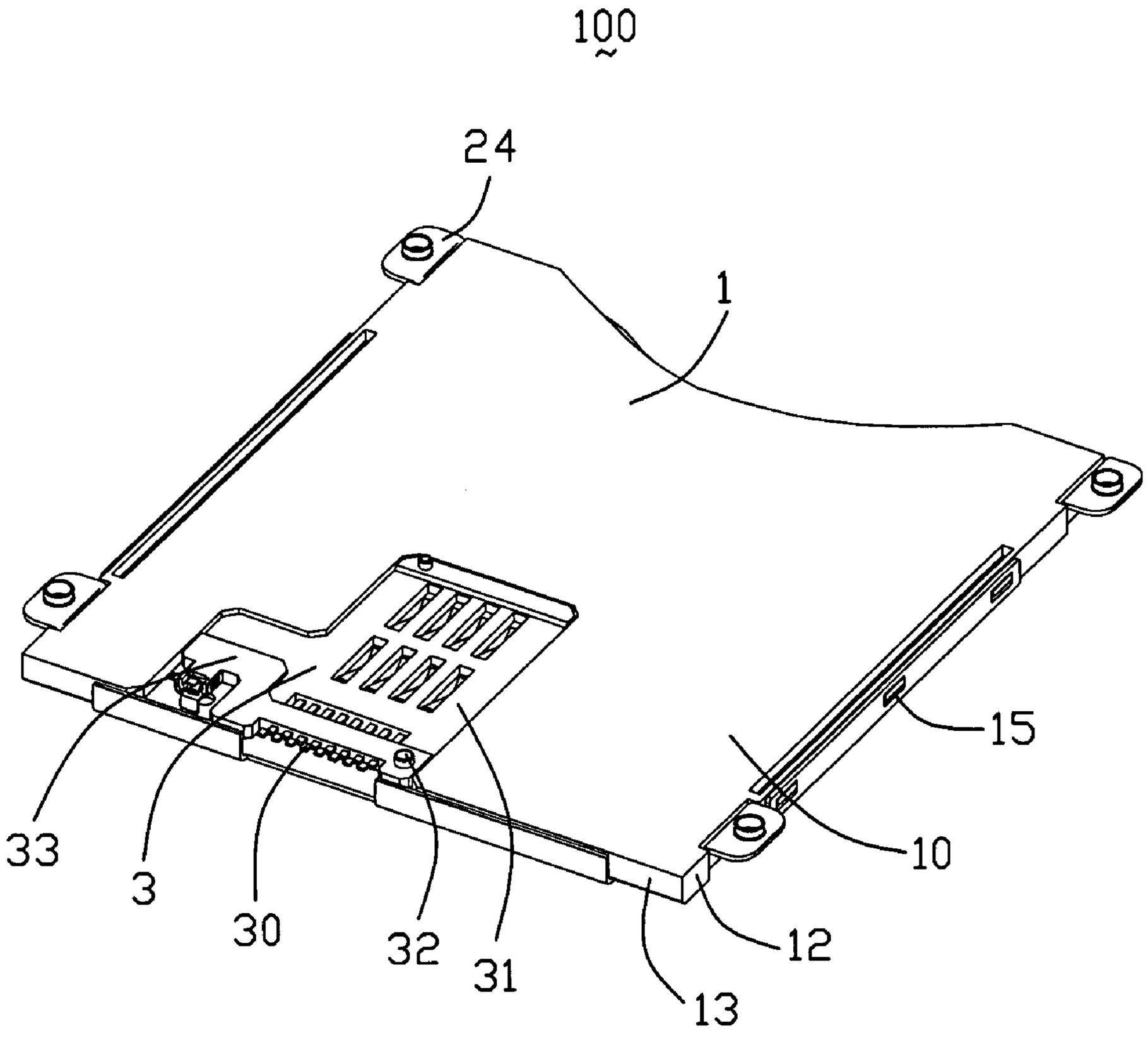



FIG. 2

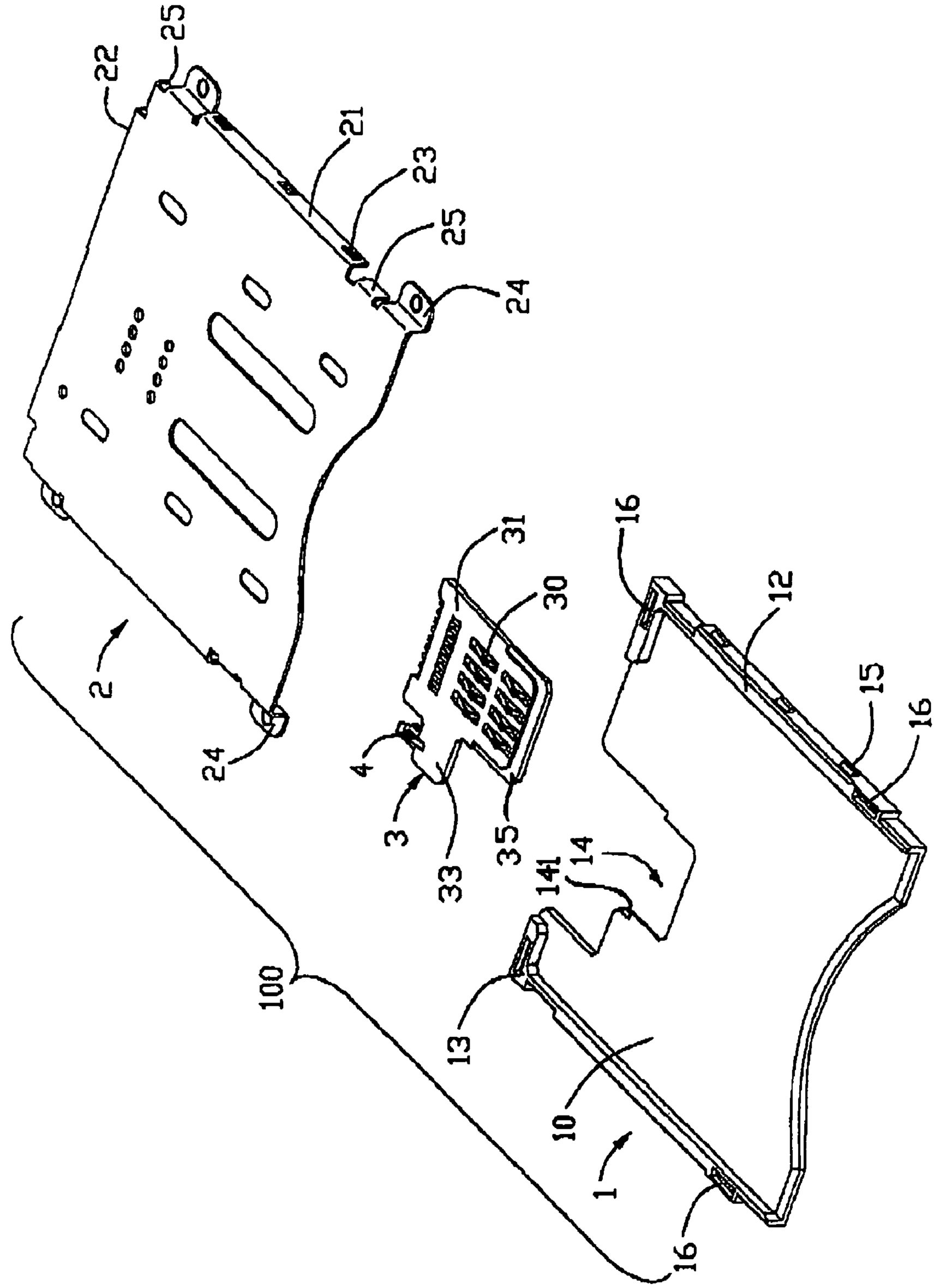



FIG. 3

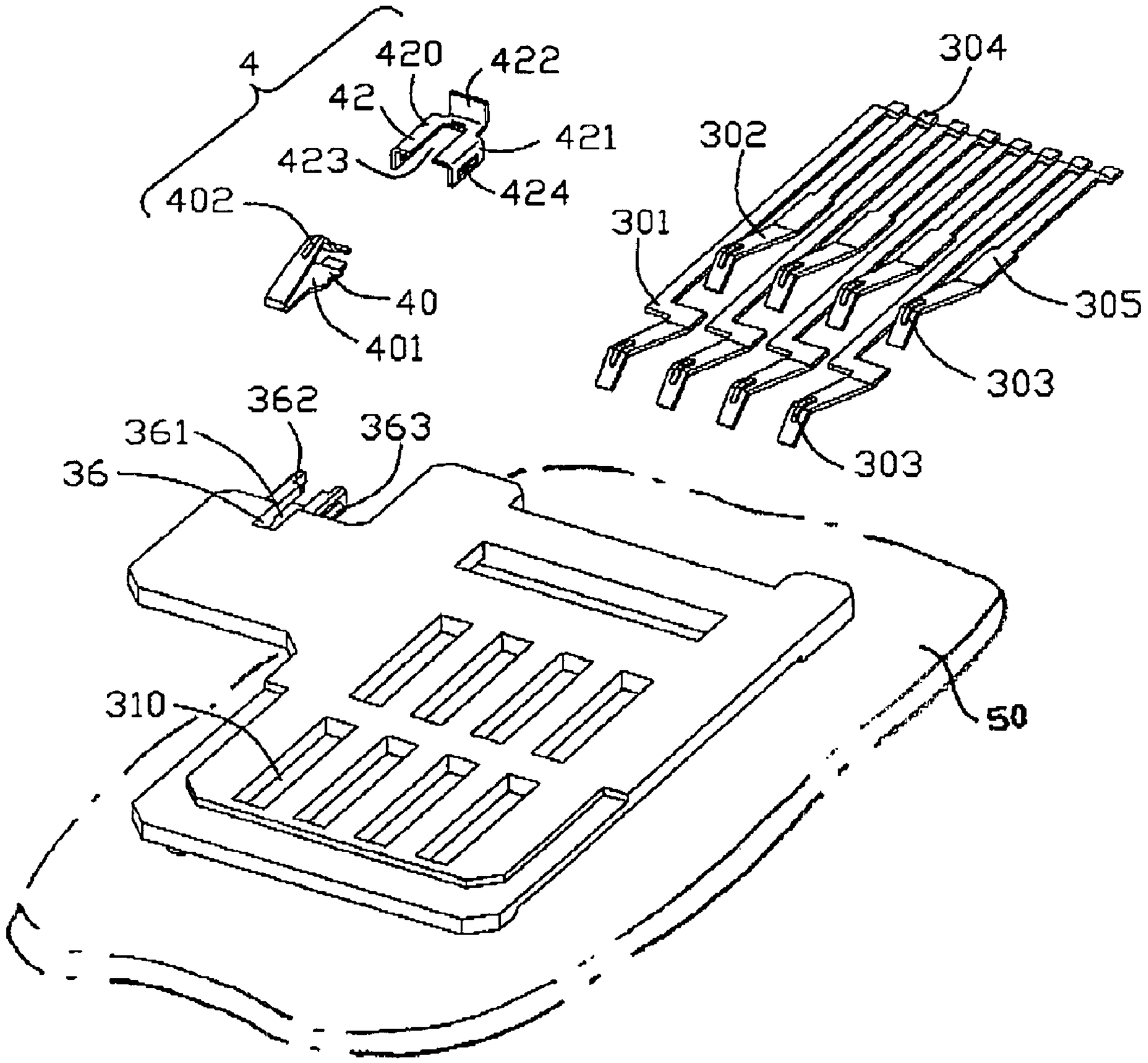

4
420
422
42
421
423
424
402
40
401
304
302
301
305
303
303
362
361
363
36
310
50

FIG. 4

# ELECTRICAL CARD CONNECTOR MOUNTED ON PRINTED CIRCUIT BOARD

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an electrical card connector for accessing an electrical card, and more particularly to an electrical card connector mounted on a Printed Circuit Board (PCB).

2. Description of Prior Arts

An universal electrical card connector is structured by an insulating housing with a plurality of terminals integrally. U.S. Pat. No. 5,470,260, for example, discloses an electrical card connector including an insulating housing, a receiving slot for a card movably received, and a number of terminals protruding into and retained in the receiving slot. The terminals are embedded by the insulating housing, and soldered on the PCB.

However, one problem of the electrical card connector in U.S. Pat. No. 5,470,260 is that the insulating housing is likely to distort during the terminals soldered with high temperature. Therefore, the electrical card connector is degradation, leading to an undesirable signal transmission between the electrical card connector and the PCB.

## SUMMARY OF THE INVENTION

An object, therefore, of the invention is to provide an electrical card connector mounted on a PCB, which can avoid an insulating housing distortion.

In the exemplary embodiment of the invention, an electrical card connector mounted on a PCB includes an insulating housing, a shell mounted on the insulating housing and a terminal module. The insulating housing defines an accommodating room, and the shell defines a receiving slot with the insulating housing for a card inserted. The terminal module comprises a plurality of terminals and a position section retained on the PCB. Wherein the terminal module is soldered on the PCB directly, and received in the accommodating room of the insulating housing separately.

Other objects, advantages and novel features of the invention will become more apparent from the following detailed description of the present embodiment when taken in conjunction with the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWING

FIG. **1** is a perspective, assembly view of an electrical card connector in accordance with the present invention;

FIG. **2** is similar to FIG. **1**, but taken from another aspect;

FIG. **3** is an exploded perspective view of the electrical card connector shown in FIG. **1**; and

FIG. **4** is an exploded perspective view of a terminal module of the electrical card connector.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIG. **1** to FIG. **2**, a perspective, assembly view of an electrical card connector **100** in accordance with present invention is shown. The electrical card connector **100** has an insulating housing **1**, a terminal module **3** receiving a plurality of terminals **30**, and a shell **2** mounted on the insulating housing **1** and the terminal module **3**.

As shown in FIG. **3**, the insulating housing **1** comprises a panel **10**, a pair of lateral parts **12** extending upwardly from



the opposite sides of the panel **10** and a tail portion **13** extending upwardly from an end edge of the panel **10**. On the panel **10**, an accommodating room **14** is defined. The configuration of the accommodating room **14** is accordant with that of the terminal module **3**. Each lateral part **12** comprises a plurality of embossments **15** located separately. A plurality of recesses **16** are defined on the lateral parts **12** and the tail portion **13** depressing in an up-to-down direction, respectively.

The shell **2** comprises a body plate **20**, a pair of lateral walls **21** extending downwardly from the opposite sides of the body plate **20**, and a back wall **22** extending from the body plate **20** between the lateral walls **21**. Each lateral wall **21** has a plurality of holes **23** corresponding to the embossments **15** and a plurality of position foots **24** tending horizontally from the low edge of the lateral walls **21**. A plurality of fasteners **25** extend downwardly from the body plate **20**.

As shown in FIG. **2** to FIG. **4**, the bottom surface of the terminal module **3** engages with a PCB **50** completely. The terminal module **3** comprises a base section **31**, a plurality of terminals **30** received in the base section **31** and a switch set **4** located beside the base section **31**.

Referring to FIG. **3** and FIG. **4**, the terminal module is shown detailedly. The base section **31** comprises a plurality of openings **310**, a plurality of position poles **32** (shown in FIG. **2**) extending downwardly from the bottom surface of the base section **31**, and a limb **33** extending horizontally and outwardly from the base section **31**. The openings **310** go through the base section **31** in an up-to-down direction, and are arranged in two rows in a front-to-back direction. The climb **33** is flat and smooth for being sucked by a picking up equipment, and has a locking section **36** for fixing the switch set **4**. The locking section **36** comprises a receiving channel **361** and a pair of locking arms **362** extending backwardly from the opposite sides of the receiving channel **361** beyond the limb **33**. On each outside surface of the locking arms **362**, a block **363** is formed.

The terminals **30** adapted for being embedded in the base section **31**, include a first terminal group **301** and a second terminal group **302**. Each terminal **30** comprises an engaging portion **303** for engaging electrically with a card, a soldering portion **304** for soldered on the PCB and a joining portion **305** connecting the engaging portion **303** with the soldering portion **304**. Each joining portion **305** of the first terminal group **301** is longer than that of the second terminal group **302**, and extends in a card insertion direction. Each engaging portion **303** of the first terminal group **301** protrudes out of the former opening **310**, and each engaging portion **303** of the second terminal group **302** protrudes out of the backer opening **310**. Accordingly, the soldering portions **304** extend beyond the rear end of the base section **31**.

The switch set **4** comprises an active member **40** and a passive member **42**. The active member **40** has a fixing section **401** resembling a lath configuration, and an elastic engaging section **402** rising slantingly from the fixing section **401**. The passive member **42** has a main body **420**, a pair of fixing arms **421** extending downwardly from the opposite sides of the main body **420**, and a projecting portion **422** extending upwardly from the main body **420** between the fixing arms **421**. The main body **420** has a hollow **423** surrounded by the fixing arms **421**. Each fixing arm **421** has a setting hatch **424** connecting with the hollow **423**. The passive member **42** is mounted on the locking arms **362** of the locking section **36**, and the hollow **423** is placed over the receiving channel **361** rightly. The fixing arms **421** matches with the locking arms **362** by the setting hatches **424** clasping corresponding blocks **363**. The fixing section **401** of the active member **40** is placed in the receiving channel **361**, and

the engaging section **402** protrudes out of the hollow **423** to be located at the frontage of the projecting portion **422**, at the same time, the end of the engaging section **402** collides with the lower surface of the main body **420**. Normally, the switch set **4** is closed. When a card is inserted, the engaging section **402** is pressed down together with the end thereof separated with the main body **420**, then, the switch set **4** is open.

Going with FIG. **1** to FIG. **4**, how to assemble the electrical card connector **100** is described in following segment. Firstly, the terminal module **3** is mounted on the PCB with the position poles **32** of the terminal module **3** plugged into the PCB. Certainly, the position poles **32** can be replaced by other position members. Secondly, the soldering sections **304** of the terminals **30** are soldered on the PCB achieving the terminals **30** connecting electrically with the PCB. The fasteners **25** of the shell **2** lock with corresponding recesses **16** of the insulating housing **1**, and the holes **23** of the shell **2** mating with corresponding embossments **15** to establish a receiving slot **5** for a card receiving movably. Thirdly, the members formed by the shell **2** and the insulating housing **1** are assembled with the terminal module **3** placed on the PCB, allowing the terminal module **3** to retain in the accommodating room **14** properly under a condition that the terminal module **3** defines a step **35** which is receivably engaged within a recess **141** defined in an underside of the housing **1**, the engaging section **303** of the terminals **30** protruding into the receiving slot **5**. Finally, the position foots **24** of the shell **2** are mounted on the PCB achieving the shell **2** and the insulating housing **1** placed on the PCB.

Comparing with prior art, the insulating housing and the terminal module of the present invention match with each other in a separated way. The terminal module is pressed partially by the insulating housing. In a word, the terminal module is soldered on the PCB, then a combination formed by the shell and the insulating housing is mounted on the PCB without soldering therebetween. Therefore, the insulating housing is capable of avoiding a distortion.

It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only, and changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

**1**. An electrical card connector mounted on a Printed Circuit Board (PCB) comprising:

an insulating housing defining an accommodating room;

a shell mounted on the insulating housing, and forming a receiving slot with the insulating housing for insertion of a card; and

a terminal module comprising a plurality of terminals and a positioning section retained on the PCB;

wherein the terminal module is soldered on the PCB directly and is received in the accommodating room of the insulating housing separately and is pressed partially by the insulating housing under a condition that the terminal module defines a step which is receivably engaged within a recess formed in an underside of the housing.

**2**. The electrical card connector as claimed in claim **1**, wherein the configuration of the terminal module accords with that of the accommodating room of the insulating housing, and the terminal module is received in the accommodating room completely.

**3**. The electrical card connector as claimed in claim **1**, wherein the positioning section of the terminal module is a positioning pole.

**4**. The electrical card connector as claimed in claim **1**, wherein the insulating housing comprises a plurality of recesses, and the shell comprises a plurality of fasteners matching with corresponding recesses of the insulating housing.

**5**. The electrical card connector as claimed in claim **1**, wherein the shell comprises a positioning foot placed on the PCB directly.

**6**. The electrical card connector as claimed in claim **1**, wherein the terminals are embedded in the terminal module.

**7**. The electrical card connector as claimed in claim **1**, wherein the terminal module comprises a base section retaining the terminals and a limb extending from a side of the base section.

**8**. The electrical card connector as claimed in claim **7**, wherein the limb is flat and smooth and comprises a switch set for detecting whether a card is inserted completely or not.

**9**. The electrical card connector as claimed in claim **1**, wherein each terminal comprises an engaging portion protruding into the receiving slot for connecting with a card electrically.

**10**. The electrical card connector as claimed in claim **9**, wherein each terminal comprises a soldering portion and a joining portion connecting the engaging portion with the soldering portion together, and the joining portion is retained in the terminal module.

**11**. The electrical card connector as claimed in claim **10**, wherein the terminals comprise a first terminal group and a second terminal group, and each joining section of the first terminal group is longer than that of the second terminal group.

**12**. The electrical card connector as claimed in claim **1**, wherein the terminal module comprises a bottom surface engaging with the PCB completely.

**13**. An electrical connector assembly for mounting to a printed circuit board, comprising:

a terminal module including an insulator equipped with a plurality of terminals under a condition that the terminal is configured to be directly soldered upon the printed circuit board;

a combination including an insulative housing and a metallic shell assembled with each other and commonly defining a horizontal card receiving cavity;

said housing being configured to be positioned upon the printed circuit board and defining an opening to compliantly receive said terminal module therein and allow contacting portions of said terminals to extend into the card receiving cavity; wherein

said housing is configured to be fastened to the printed circuit board and presses on parts of the terminal module under a condition that the terminal module defines a step which is receivably engaged within a recess formed in an underside of the housing.

**14**. The connector assembly as claimed in claim **13**, wherein said opening is dimensioned and configured not to allow the terminal module to completely pass through so that the terminal module is required to be first mounted to the printed circuit board before the housing mounted to the printed circuit board.

**15**. The connector assembly as claimed in claim **13**, wherein said terminal module is equipped with at least on downward post for coupling to a hole in the printed circuit board.

16. The connector assembly as claimed in claim 13, wherein the insulator and the housing have no direct fastening relation with each other.

17. A method of mounting a card connector to a printed circuit board, comprising in sequence steps of:

providing a terminal module with an insulator equipped with a plurality of terminals thereon;

mounting the terminal module to the printed circuit board and soldering tails of the terminals to the printed circuit board;

providing a combination including an insulative housing and a metallic shell assembled to each other under a condition that said housing and said shell commonly define a horizontal card receiving cavity, and said housing further defines an opening;



fastening the combination to the printed circuit board under condition that the terminal module is received in the opening and contacting portions of the terminals extend into the card receiving cavity, and that the terminal module defines a step which is receivably engaged within a recess formed in an underside of the housing.

18. The method as claimed in claim 17, wherein said housing is fastened to the printed circuit board via a non-soldering process.

19. The method as claimed in claim 17, wherein the opening is dimensioned and configured not to allow the terminal module to pass therethrough completely.

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